REMARKS

Claim Objections

The Examiner has indicated that the claims are misnumbered and that the claims have been renumbered as Claims 10-46. The Examiner's attentiveness is appreciated. The Examiner's re-numbering of the claims is used herein. Note, that the labeling of the claims as "Currently Amended", or "Previously Added" assumes such renumbering has been already entered.

Additionally, the Examiner indicates that Claims 1-9 should have been cancelled instead of Claim 1-19. Accordingly, it is requested here that Claims 1-9 be cancelled from the present application thereby leaving Claims 10-46 pending.

Claim Rejections under 35 USC 112

The Examiner has rejected Claims 10-24, and 46 under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding Claim 10, the Examiner states that the phrases "wherein when said enclosure ... is positioned at a location..." and "said concentration is maintained in an area about said enclosure for at least two weeks..." render the claim vague and indefinite since these are not positive recitations of method steps involved in using the enclosure."

Both of the phrases on which the Examiner has based his rejection have been amended. However, it is believed that such phrases do not make Claim 10 indefinite. In particular, it is believed that a person of ordinary skill in the art can clearly understand the scope of the limitations provided by the two amended "wherein" clauses of Claim 10. It is well settled that the claims need only to set out and clearly describe a particular area with a reasonable degree of precision and particularity, wherein the determination of whether there is such precision and particularity is not to be performed in a vacuum, but always in light of the teachings of the prior art and of the particular application disclosure as it would be interpreted by one possessing the ordinary level of skill in the pertinent art. In re Angstadt and Griffin, 190 USPQ 214, 217 (see CPA 1976). If the claims read in light of the specification reasonably apprise those skilled in the art of the scope of the invention, § 112

demands no more. Hybritech, Inc. vs. Monoclonal Antibodies, Inc. 802 Appl. Sec. 1367,1375 (Federal Circuit 1986), Cirt. Denied, 480 U.S. 947 (1987). Thus, the amended "wherein" clauses of Claim 10 appear to be acceptable claim limitations. If the Examiner disagrees, it is respectfully requested that the Examiner explain any problems which the Examiner perceives.

The amended versions of these "wherein" clauses of Claim 10 are as follows:

"wherein when said enclosure is in a desired position, at substantially the location, with said emitting source in said enclosure, a concentration of said at least one gas is emitted from said openings so that when said concentration is encountered by the termites, the termites are attracted to said emitting source;" and

"wherein said emitted concentration remains in an area about said enclosure for at least two weeks so that the termites are attracted to said emitting source rather than to a structure sought to be protected from the termites."

As further justification for retaining the amended wherein clauses of Claim 10, the Examiner is referred to the following passages of the MPEP which discuss the appropriateness of functional limitations within claims:

MPEP 2171: "There are two separate requirements set forth in this paragraph:[35 USC 112 second paragraph]

(A) the claims must set forth the subject matter that applicants regard as their invention; and

(B) the claims must particularly point out and distinctly define the metes and bounds of the subject matter that will be protected by the patent grant.

The first requirement is a subjective one because it is dependent on what the applicants for a patent regard as their invention. The second requirement is an objective one because it is not dependent on the views of applicant or any particular individual, but is evaluated in the context of whether the claim is definite — i.e., whether the scope of the claim is clear to a hypothetical person possessing the ordinary level of

skill in the pertinent art."

MPEP 2173: "The primary purpose of this requirement [35 USC 112, second paragraph] of definiteness of claim language is to ensure that the scope of the claims is clear so the public is informed of the boundaries of what constitutes infringement of the patent."

MPEP 2173.05(g): "A functional limitation must be evaluated and considered, just like any other limitation of the claim, for what it fairly conveys to a person of ordinary skill in the pertinent art in the context in which it is used. A functional limitation is often used in association with an element, ingredient, or step of a process to define a particular capability or purpose that is served by the recited element, ingredient or step."

Thus, it is believed that the Examiner's rejection of Claims 10 through 24 has been overcome. Moreover, since Claim 46 has similarly amended "wherein" clauses to those of Claim 10 recited above, it is believed that the Examiner's rejection of Claim 46 has also been overcome.

Amendments to the Claims Having Support In The Amendments To the Specification

The substitute specification has been amended on page 18, line 16 to recite the insecticide "hexaflumuron" instead of –hexaflurone--. Hexaflurone is merely a misspelling of "hexaflumuron". Moreover, it is believed that there is no insecticide or insect growth regulator that is known by the name "hexaflurone". Thus, it is requested that Applicants be allowed to amend both the specification and Claims 19, 34, 55, and 77 to recite "hexaflumuron" instead of –hexaflurone--.

Claim Rejections

The Examiner has rejected Claims 10, 11, 16, 21, 25, 26, 31, 36, 43-46 under 35 U.S.C. 102(b) as anticipated by Schmittman, US patent 5,394,643. The Examiner has

rejected Claims 10-14, 16, 18, 19, 21, 25-29, 31, 33, 34, 40-46 under 35 U.S.C. 102(b) as anticipated by Snell et. al. US patent 6,158,166). Additionally, Claims 11, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmittman. The Examiner has also rejected Claims 10-14, 16-19, 21, 23-29, 31-34,, 36, 38-46 under 35 U.S.C. 103(a) as being unpatentable over Snell e. al. in view of "Immediate and Latent Effects of Carbon Dioxide on Insects" by Gerard Nicolas (Nicolas herein). Moreover, the Claims 15, 22, 30, 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Snell in view of Waters (US 4,506,473).

Rejection of Claim 10 under 35 USC 102(b) by Schmittman

Regarding Claim 10, the Examiner's 102(b) rejection by Schmittman is respectfully traversed for the following reasons:

(1.1) Schmittman is not directed to, does not disclose, and does not suggest attracting termites with carbon dioxide. Instead, Schmittman provides a suffocating dosage of carbon dioxide for killing (not attracting) various types of insects. Moreover, Schmittman states that his apparatus is used to rapidly suffocate the insects (Schmittman Col. 3, lines 1-2).

(1.2) Claim 10 recites that the concentration of CO_2 (or mimic thereof) is such that the termites "are attracted to said emitting source rather than to a structure sought to be protected from the termites". Certainly Schmittman's CO_2 concentration for rapidly killing termites within their nests would not be considered a concentration of CO_2 that allows the termites to selectively choose the CO_2 emitting source over a structure that is desired to be protected from the termites.

(1.3) The Examiner appears to equate the openings of the enclosure of Claim 10 with openings in the ground which Schmittman's apparatus encloses when sealed thereto; i.e., the Examiner's rejection appears to be based on the combination of Schmittman's apparatus plus the portion of ground surface to which the apparatus is sealed. However, the claim limitation of: "***wherein said enclosure is, at least prior to being placed in the desired position, separate from the location having the termites***" in the present claim is not

disclosed in Schmittman (and certainly not in the combination of the Schmittman apparatus and the ground). For example, the claimed enclosure is separate from the location having the termites prior to the enclosure being moved into the desired position at the location, and additionally the enclosure may be also removed from its position at the location for examination and/or inspection.

(1.4) Claim 10 recites that the termite attracting gas is to remain "***about said enclosure***" in the concentration range "for at least two weeks so that the termites are attracted to said emitting source rather than to a structure sought to be protected from the termites".

Schmittman does not suggest or disclose that the insects he suffocates are selectively attracted to Schmittman's emitting source instead of a structure to be protected.

Moreover, the Examiner states that "the treated sites were treated until the insects were destroyed, i.e., however long it takes". This does not appear to be what Schmittman is saying. In particular, in the passage where Schmittman describes the "treatment", it is less than five minutes in duration (since after five minutes that treatment had ended and inspection of the ants had commenced). Schmittman states:

> "All ants on the surface were dead when the hood was removed ***after five minutes***. Digging in the ground then revealed that there were no longer any living ants. This treatment was conducted at nine other places where there were ant nests. The treated sites were inspected after one hour, on the following day, and after one week." (Schmittman, Col. 4, lines 18-24).

Schmittman is therefore properly viewed as a "teaching away" from the present invention. That is, the present invention is directed to attracting termites with a gas mixture that remains about the enclosure for "at least two weeks" as Claim 10 recites. The invention is not for rapidly killing insects within about five minutes.

To further reinforce that Schmittman's treatments are of very short duration, it is believed that the inspections Schmittman refers to in the above passage (i.e., those taking place "after one hour, on the following day, and after one week") are, indeed, merely to inspect the sites where the Schmittman's apparatus was previously used for killing insects at the sites. Moreover, for the single instance where ants (not termites) where not all killed, there was a "repetition of the process of the [Schmittman] invention"; i.e., Schmittman's hood was again tightly sealed over the ant hill and a concentration of 30% CO_2 was again injected under the hood. Thus, it can not be said that a CO_2 concentration, as recited in Claim 10, "remains in an area about said enclosure for at least two weeks".

Moreover, even the longer time periods that Schmittman discloses for application of his apparatus are apparently less than two hours in one case (for various insects such as beetles and aphids), and less than twelve hours in the other case. That is, Schmittman states:

> "Carbon dioxide gas at 30% by volume, for example, was introduced into the container. The gas mixture was pumped out and replaced by air ***after two hours***. Inspection revealed that all insects were dead. The plants had not suffered any kind of injury. A ***12-hour experiment*** gave the same result, as did experiments with rodents." (Schmittman, Col. 4, lines 49-55).

Thus, it is believed that the 102(b) rejection to Claim 10 is overcome.

Rejections of Claims 11, 16, 21, 25, 26, 31, 36, 43-46 under 35 USC 102(b) by Schmittman and Rejections of Claims 11, 26 under 35 USC 103(a) by Schmittman

Regarding Claims 11, 16 and 21, these claims are believed allowable over Schmittman due to their dependence upon Claim 10. In particular, both the 102(b) and 103(a) rejection of Claim 11 is believed to be overcome by this claim's dependence upon Claim 10.

Regarding Claim 25, amendments have been made to this claim corresponding to those made to Claim 10. Accordingly, since the reasoning for rejecting Claim 25 under 102(b) by Schmittman is believed to be the same as for rejecting Claim 10, it is believed that the same reasoning of (1.1) through (1.4) above is also applicable for overcoming the Schmittman rejection of Claim 25.

Regarding Claims 26, 31 and 36, these claims are believed allowable over Schmittman due to their dependence upon Claim 25. In particular, both the 102(b) and 103(a) rejection of Claim 26 is believed to be overcome by this claim's dependence upon Claim 25.

Regarding Claim 43, this claim states that the termites are attracted through the openings in the enclosure recited in Claim 25, and moreover such attraction is by the emitting source. As discussed in (1.2) above regarding Claim 10, the Examiner appears to believe that the enclosure openings of Claim 25 can correspond to opening in the ground over which the Schmittman apparatus is provided. However, since Schmittman's inert gas (e.g., CO_2) is used to rapidly suffocate the insects (Schmittman Col. 3, lines 1-2), Schmittman teaches away from any termite attraction through such ground openings. Indeed, there is no teaching or suggestion in Schmittman of attracting insects through any opening. Moreover, as discussed in (1.3) above, the claim limitation of: "***wherein said enclosure is, at least prior to being placed in the desired position, separate from the location having the termites***" in Claim 25 is not disclosed in Schmittman (and certainly not in the combination of the Schmittman apparatus and the ground). Thus, it is believed that Claim 43 is allowable over Schmittman both due to its dependence upon Claim 25, as well as the reasoning provided here.

Regarding Claim 44, there is no teaching or suggestion of Schmittman's apparatus being used in a manner where it "includes a sufficient amount of said emitting source for maintaining the emissions of the at least one gas so that at least about 0.2% by volume of air is encountered by termites over a period of at least two months in area large enough to reduce termite attraction to the structure". As mentioned above, Schmittman's apparatus and method is for rapidly suffocating insects. Accordingly, Schmittman does not teach or suggest that his apparatus provide a sufficient amount of CO_2 emitting source for emitting CO_2 over a period of at least two months. In fact, it appears that the duration of emission is

relatively short since in the examples Schmittman uses to illustrate his apparatus, the longest time he recites for keeping his enclosure sealed to the ground is 5 minutes (and 12 hours for, presumably potted, plants being transported). Thus, CO_2 emissions would be at most as long as Schmittman's enclosure or hood is sealed to the ground; i.e., about five minutes. Additionally, note there is no disclosure in Schmittman as to how he would continue to pump, e.g., a 30% concentration of CO_2 into the ground (and through termite tunnels therein) for a period of at least two months. Surely this would require undisclosed enhancements to Schmittman's apparatus. Accordingly, it is believed that Claim 44 is allowable over Schmittman both due to its dependence upon Claim 25 as well as the reasoning provided here.

Regarding Claim 45, it is believed that this claim is allowable over Schmittman for substantially the same reasoning as for Claim 25.

Regarding Claim 46, it is believed that this claim is allowable over Schmittman for substantially the same reasoning as for Claim 10.

Rejection of Claim 10 under USC 35 102(e) by Snell et. al.

Regarding the Examiner's 102(b) rejection of Claim 10 by Snell, this rejection is respectfully traversed. The Examiner states that Snell "discloses providing an enclosure (10c or 182) having openings (see Figs. 31-33 or Figs. 43-49); providing in the enclosure an emitting source of emitting CO_2 (CO_2 source 242 and released from holes 240 or expanded polystyrene attractive to termites)". The Examiner's statement is respectfully traversed for the following inaccuracies:

(2.1) Regarding Figs. 31-33 of Snell, Snell states: "FIGS. 31, 32 and 33 are various view[s] of another **ground crawling pest control device** according to the present invention. The device, identified generally by reference numeral 10c, is particularly adapted for capturing fleas and other ground crawling pests." (Snell, Col. 23, lines 62-66). That is, the device of these figures are for ground crawling pests which Snell defines as:

> 'A "ground crawling pest" shall be construed to include ground crawling insects and similar creatures including, without limitation, ants, cockroaches, crickets, ground beetles, earwigs, ladybugs, fleas (although

adult fleas move by jumping rather than crawling or walking), spiders, centipedes, millipedes, slugs, and flying insects which may land and crawl or walk into a ground crawling pest control device such as first component 12. **A [g]round crawling pest within the present context, however, shall not include termites or rodents.**' (Snell, Col. 13, lines 47-56).

Accordingly, the device shown in Snell's Figs. 31-33 is explicitly NOT intended to be used for termites. Thus, since Snell's compartments 242 are only shown in Fig. 32, which shows an apparatus not intended to be used for termites, certainly the compartment 242 can not be used as grounds for rejecting Claim 10 in that Snell explicitly teaches away from Figs. 31-33 being used for attracting termites.

(2.2) Regarding Snell's embodiment of a "termite control material" shown in Figs. 47-50, Snell states:

"Rigid foam materials such as styrofoam and the like are attractive to termites as ***insulative*** habitats and therefore are useful as termite attractants." (Snell, col. 9, lines 49-52), and

"FIGS. 47, 48, 49 and 50 represent several views of a termite control material 364 according to the present invention which [is] suitable for use in termite tube 182 or similar such tubes heretofore known in the art. Termite control material 364 is preferably fabricated from substantially rigid foam material such as expanded polystyrene, or the like. Such materials are frequently used as insulation in building construction. When used as such, these materials have been demonstrated a propensity for infestation by termites. Clearly, such materials are insulative and thus may serve as shelter, but they also **tend** to release gases such as carbon dioxide gas which **may** serve as an intoxicant-type attractant to termites. Rigid foams last longer than wood because of their inherent resistance to rot and decay and are therefore especially advantageous for use as termite control material." (Snell, col.27, line 65 through col. 28, line 12).

Regarding the Snell passage immediately above, the Examiner appears to be saying that the mere statement that a rigid foam insulator **may** release some concentration of carbon dioxide is sufficient for rejecting Claim 10 even though no concentrations are given or even suggested. Presumably, the Examiner is asserting that anticipation of Claim 10 is inherent from Snell. Accordingly, the following are descriptions of what is meant by "inherency" (as defined in the MPEP and applied by the courts), and its applicability to Claim 10:

(a) MPEP 2112: "The fact that a certain result or characteristic **may** [underlining is in the MPEP] occur or be present in the prior art **is not sufficient** to establish the inherency of that result or characteristic. In re Rijckaert, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993) ... In re Oelrich, 666 F.2d 578, 581-82, 212 USPQ 323, 326 (CCPA 1981). "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is **necessarily present** in the thing described in the reference, **and** that it would be so **recognized by persons of ordinary skill**. Inherency, however, **may not be established by probabilities or possibilities**. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.' "

Accordingly, it is respectfully submitted that:

(i) Snell does not disclose any CO_2 concentration or range for attracting termites. Thus, the CO_2 concentration presumably provided by his tube 182 might be: (1) between 0.05% (e.g., 0.5mmol/mol) and 0.1% (e.g., 1mmol/mol), or (2) between 0.1% and 0.15% (e.g., 1.5mmol/mol), or (3) between 0.15% and 0.2% (e.g., 2mmol/mol). Said another way, Snell never discloses or even suggests emitting a CO_2 concentration within the claimed range of at least 0.2% (this range being at least twice, and up to four times, the concentration of ambient air). In particular, note that the present patent application states that: "Typically, ambient

CO_2 concentrations are around .05% and up to .1% in urban areas." (Page 14, lines 17-18). Thus, all of the above mentioned CO_2 ranges (1)-(3) could all be considered ranges where CO_2 is elevated above the ambient environment.

(ii) Snell does not support his statement that termites are attracted to expanded polystyrene due to CO_2 emitted therefrom. It appears that Snell is only **hypothesizing** that **some** rigid foam material tends to release **some** concentration of CO_2 that is attractive to termites. Moreover, even the "expanded polystyrene" that Snell identifies as the rigid foam material is not specific enough to even guess at a CO_2 concentration that might be released from Snell's termite control tube 182 in that it is known that many "expanded polystyrene" foams **do not release CO_2**. Indeed, Applicants and Applicants' representatives have been unable to find a single reference that substantiates Snell's assertion that expanded polystyrene emits any appreciable amount of CO_2. If the Examiner is aware of such a reference, it is respectfully requested that the Examiner cite the reference and provide Applicant's representative with a copy of it.

(iii) Snell does not disclose or suggest that a CO_2 concentration remains in an area about the enclosure for an extended period of time such as "at least two weeks" as recited in Claim 10. Indeed, since Snell apparently believes that the attractiveness of expanded polystyrene is due to both an emission of an (unspecified) amount of CO_2 and the insulating properties of expanded polystyrene, there is no indication that Snell's CO_2 concentration must remain within the range of at least 0.2%. Thus, even if by some chance, a CO_2 concentration of at least 0.2% were emitted for some period of time, there is no provision or disclosure of how such a concentration would remain at such a level for at least two weeks.

Moreover, Snell is apparently attracting termites using such rigid foam materials as much for its insulation qualities as anything else. Again referring to the two Snell passages recited above, the first passage states that such rigid foam materials "**are** attractive to termites as **insulative habitats** and therefore are useful as termite attractants." The second Snell passage states that such rigid foam materials "may serve as shelter, but they also **tend** to release gases such as carbon dioxide has which **may** serve as an intoxicant-type attractant to termites." Thus, the CO_2 concentration range and the duration that the concentration must remain in an area is NOT "necessarily present" for Snell's apparatus to function as required by, e.g., MPEP 2112, and accordingly, Claim 10 is not inherent from the Snell reference.

(b) MPEP 2112: "In relying upon the theory of inherency, the examiner **must provide a basis in fact and/or technical reasoning** to reasonably support the determination that the allegedly inherent characteristic **necessarily** flows from the teachings of the applied prior art." Ex parte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990)". Note that this MPEP passage continues by stating that: "The Board reversed [the Examiner's inherency claim rejection] on the basis that the examiner did not provide **objective evidence or cogent technical reasoning** to support the conclusion of the inherency." For at least the reasoning of (i) through (iii) immediately above, it is respectfully submitted that the Examiner has neither provided such a basis in fact nor technical reasoning of the **necessity** that Snell's tube 182 releases a CO_2 concentration in the range recited in Claim 10 for the period of time recited in Claim 10.

(c) Regarding process claims, MPEP 2112.02 states: "Under the principles of inherency, if a prior art device, in its normal and usual operation, would **necessarily** perform the method claimed, then the method claimed will be considered to the anticipated by the prior art device." It is respectfully submitted that the Examiner can not support any objective evidence or

technical reasoning that requires the Snell tube 182, in its normal and usual operation, to release the CO_2 concentrations recited in Claim 10 for the period of time recited. Indeed, it is unclear what the normal and usual operation is regarding the CO_2 releasing characteristics of Snell's rigid foam material. Indeed, Snell's subterranean termite tube 182 may perform equally well with insulation that releases no CO_2 in that it provides: (1) insulation so that the termites are shielded from temperature extremes, (2) wood for food, and (3) "a first component 12" for controlling ground crawling pests (e.g., ants, etc.) that could out compete the termites for access to Snell's subterranean termite tube 182.

Thus, it is respectfully submitted that the Snell rejection to Claim 10 has been overcome.

Rejections of Claims 11-14, 16, 18, 19, 21, 25-29, 31, 33, 34, 40-46 under 35 USC 102(e) by Snell

Regarding Claims 11-14, 16, 18, 19 and 21, these claims are believed allowable over Snell due to their dependence upon Claim 10.

Regarding Claim 25, amendments have been made to this claim corresponding to those made to Claim 10. Accordingly, since the reasoning for rejecting Claim 25 under 102(e) by Snell is believed to be the same as for rejecting Claim 10, it is believed that the same reasoning of (2.1) and (2.2) above is also applicable for overcoming the Snell rejection of Claim 25.

Regarding Claims 26-29, 31, 33, 34, 40, 41, and 43, these claims are believed allowable over Snell due to their dependence upon Claim 25.

Regarding Claim 42, this claim is directed to three specific species of termites, none of which are disclosed in Snell as being attracted by any particular CO_2 concentration. Accordingly, it is believed that the 102(e) rejection by Snell is overcome both due to this claim's dependence upon Claim 25, and due the limitations of Claim 42 not being disclosed or suggested by Snell.

Regarding Claim 44, there is no teaching or suggestion of any embodiment of Snell's apparatus being used in a manner where it "includes a sufficient amount of said emitting

source for maintaining the emissions of the at least one gas so that at least about 0.2% by volume of air is encountered by termites over a period of at least two months in area large enough to reduce termite attraction to the structure." Accordingly, it is believed that Claim 44 the 102(e) rejection as anticipated by Snell is overcome both due to its dependence upon Claim 25 as well as the reasoning provided here.

Regarding Claim 45, it is believed that the Examiner's 102(e) rejection as anticipated by Snell of this claim is overcome for substantially the same reasoning as for Claim 25.

Regarding Claim 46, it is believed that the Examiner's 102(e) rejection as anticipated by Snell is overcome for substantially the same reasoning as for Claim 10.

Obviousness Rejection Criteria

Prior to a discussion of Examiner's obviousness rejection of Claim 10, a discussion of the criteria for obviousness is provided here.

There are numerous court cases regarding appropriate criteria for maintaining an obviousness rejection. Basically, the following criteria must be satisfied: (3.1) the cited references **must teach all the elements** in the rejected claim, (3.2) the cited references must be able to be combined to yield the claimed invention, and (3.3) in the cited references, there must be some prior art reference with explicit teaching or motivation for combining the claimed elements.

Moreover, an obviousness rejection must not be based on an "obvious to try" criteria.

The following court rulings on obviousness provide illustrative evidence of the criteria (3.1) through (3.3) above:

(a) ***A rejection based on §103 clearly must rest on a factual basis***, and these facts must be interpreted ***without hindsight reconstruction*** of the invention from the prior art. In making this evaluation, all facts must be considered. The Patent Office has the initial duty of supplying the factual basis for its rejection. It may not, because it may doubt that the invention is patentable, resort to speculation, unfounded assumptions or hindsight reconstruction to supply deficiencies in its factual basis.

"The genius of invention is often a combination of known elements which in hindsight seems preordained." *McGinley v. Franklin Sports, Inc.*, 262 F.3d 1339, 1351 (Fed. Cir. 2001).

Thus, "[t]he notion . . . that combination claims can be declared invalid merely upon finding similar elements in separate prior patents would necessarily destroy virtually all patents and cannot be the law under the statute, § 103." *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1575 (Fed. Cir. 1987); *see also Arkie Lures, Inc. v. Gene Larew Tackle, Inc.*, 119 F.3d 953, 957 (Fed. Cir. 1997) ("It is insufficient to establish obviousness that the separate elements of the invention existed in the prior art, absent some teaching or suggestion, in the prior art, to combine the elements").

(b) ***The fact that individual elements of the invention can be found in the prior art is irrelevant***. The Federal Circuit reiterated this rule in Grain Processing Corp. v. American Maize Products Co., 5 USPQ2d 1788 (Fed. Cir. 1988).

(c) ***The Examiner should not be able to pick and choose individual elements from multiple references to recreate the invention***. Polaroid Corp. v. Eastman Kodak Co., 229 USPQ 561 (Fed. Cir.), cert. denied, 479 U.S. 850 (1996).

(d) ***Prior art must suggest the desirability of the combination***. In re Fritch, 23 USPQ2d 1780 (Fed. Cir. 1992) ("***mere fact that prior art may be modified to reflect features of claimed invention does not make modification, and hence the claimed invention, obvious*** unless desirability of such modification is suggested by prior art).

(e) ***The motivating suggestion must be explicit***. Winner International Royalty Corporation v. Wang, 48 USPQ2d 1139 (D.C, D.C. 1998) ("there must have been some explicit teaching or suggestion in the art to motivate one of even ordinary skill to combine such elements so as to create the same invention").

(f) ***"Obvious to try" is not to be equated with obviousness under 35 U.S.C. §103.*** The Federal Circuit has held that an "obvious to try" situation exists when a general disclosure may pique a scientists curiosity, such that further investigation might be done as the result of a disclosure, but the disclosure itself does not contain a sufficient teaching of how to obtain the desired result, or that the claimed result would be obtained if certain directions were pursued. In re Eli Lilly & Co., 14 USPQ 2d 1741, 1743 (Fed.Cir. 1990). The court held, however, that ***"obvious to try" is not to be equated with obviousness under 35 U.S.C. §103.*** See Gillette Co. v. S.C. Johnson & Son, Inc., 16 USPQ 2d 1923, 1928 (Fed.Cir. 1990).

(g) ***"Common knowledge" of one skilled in the art can not be substituted for specific evidence that the prior art suggests an invalidating combination of references.*** An obviousness determination may not substitute "common knowledge" of one skilled in the art for specific evidence that the prior art suggests an invalidating combination of references. In re Sang Su Lee, 61 USPQ2d 1430 (Fed. Cir. 2002)

Rejection of Claim 10 under 35 USC 103(a) by Snell et. al. in view of Nicolas

The Examiner has rejected Claim 10 under 35 U.S.C. 103(a) as being unpatentable over Snell et al. (U.S. patent 6,158,166) in view of the article "Immediate and Latent Effects of Carbon Dioxide on Insects" by Nicolas and Sillans (Nicolas herein). In particular, the Examiner states:

"Snell et al. discloses a termite attractive material (364) which releases gases such as carbon dioxide which serve as an intoxicant-type attractant to termites, but does not particularly disclose a concentration of CO_2 being approximately 0.2% by volume of an ambient atmosphere. Nicolas discloses that CO_2 is a known attractant for many invertebrates, which perform oriented responses to a CO_2 gradient, and that some species live in environments with higher CO_2 and lower O_2 contents than those of the normal atmosphere. Within the nests of termites of the subfamily Macrotermitinae, CO_2 concentrations ranging from 0.8 to 2.9% and from 1.2 to 5.2% have been recorded. It would have been obvious to a person of ordinary skill in the art to make

the concentration of CO_2 in the device of Snell et al. such that it is approximately 0.2% by volume of an ambient atmosphere in view of Nicolas in order to provide a CO_2 gradient which is attractive and familiar to the termites so that they can be effectively attract to the termite control device of Snell et al."

The Examiner's 103(a) rejection of Claim 10 is respectfully traversed.

As the Examiner has correctly pointed out, Snell does not disclose a concentration of CO_2 being approximately 0.2% (or higher) by volume of an ambient atmosphere. However, in attempting to combine Nicolas with Snell, it appears that the Examiner is incorrectly interpreting Nicolas and/or is making unjustified assumptions regarding what CO_2 concentrations one of ordinary skill in the art might utilize in attempting to attract termites. In particular, it is requested that the Examiner consider the following analyses:

(4.1) The Examiner appears to be assuming that Nicolas teaches or suggests that an enhanced concentration of CO_2 within the range recited in Claim 10 is "attractive and familiar to the termites" since such a range may be similar to the concentration of CO_2 in a termite nest. There are three problems with this assumption.

Firstly, this assumes that it was known by one of ordinary skill in the art prior to the present invention that since termites have nests with elevated CO_2 concentrations, that termites are attracted to such concentrations. Without additional information such reasoning is generally not true. For example, termite nests are also likely to have a lower concentration of both oxygen and nitrogen (due to the increased CO_2 concentration); thus would the Examiner be willing to assert that termites are attracted to reduced oxygen environments and/or reduced nitrogen environments? Moreover, applying the Examiner's reasoning to people would apparently yield the following proposition: since it is known that where people congregate in a confined area, the CO_2 concentration increases, this implies that people are attracted to CO_2. Again, without further evidence, there is no reason to believe this proposition is true, and in fact, it is not true.

Secondly, Nicolas does not disclose or suggest that the subfamily Macrotermitinae of termites are attracted to CO_2.

Thirdly, Nicolas does not disclose or suggest any CO_2 concentration range for attracting termites. In fact, Nicolas at most, discloses no more than Snell regarding attracting termites with specific CO_2 concentrations.

(4.2) Regarding the Nicolas passage: "CO_2 is a known attractant for many invertebrates", Nicolas only provides specifics on such CO_2 attractiveness for various hematophagous (blood feeding) insects, and wasp pollinators. Nicolas does not describe any CO_2 concentration that is attractive to termites. The Examiner's reference to the CO_2 concentration within the nests of termites of the subfamily Macrotermitinae is merely illustrative of the wide range of CO_2 concentrations various species of insects naturally encounter, plus the wide range of insect behaviors such CO_2 concentrations appear to foster. For example, in the same paragraph that Nicolas discusses CO_2 concentration in Macrotermitinae nests, he also discusses CO_2 concentrations in bee hives, and he then states that "Some termites rebuild porous part of their nests, if the internal CO_2 concentration increases from 1 to 2%." Thus, it appears termites are actively attempting to remove even relatively small increases in CO_2 concentrations from their nests, which can be viewed as a teaching away from the Examiner's reasoning as to why termites might be attracted to particular concentrations of CO_2. Accordingly, the cited passages of Nicolas do not disclose or suggest that termites are attracted to any CO_2 concentration, much less a particular CO_2 concentration range as provided in Claim 10. Accordingly, it appears that the obviousness criteria (3.1) above (i.e., that the cited references must teach all the elements) is not satisfied. Thus, since a §103 rejection must rest on a factual basis (and without hindsight reconstruction of the invention from the prior art), it is believed that the Examiner's reasoning for the present rejection of Claim 10 is insufficient to sustain this rejection.

(4.3) Nicolas also has numerous passages describing conditions in which various insects are also repelled by various seemingly relatively low CO_2 concentrations. For example, the above cited Nicolas passage regarding the rebuilding of termite nests when the internal CO_2 concentration increases from 1 to 2% appears to be one such passage in that the termites are apparently actively attempting to rid the

nest of an enhanced (but relatively low) CO_2 concentration. Additionally, Nicolas subsequently states: "Depending on the insect species, CO_2 concentrations ranging from 1.5% to 6.5% have a repellent effect" (Nicolas, page 99, lines 26-27). Nicolas further states that: "Perhaps the most striking impression left by the collective papers on CO_2 actions [on insects] is that of the **diversity of these actions and the wide variety of levels at which this gas may act**" (Nicolas, page 109, beginning of Concluding Remark). Thus, it is believed that these Nicolas passages would not tend to suggest to one of ordinary skill in the art that termites would be attracted using the CO_2 concentration range of Claim 10.

Accordingly, due to the analyses of (4.1) – (4.3) above, it is believed that Nicolas does not disclose or suggest a CO_2 concentration in the range recited in Claim 10, and does not disclose or suggest providing this concentration for at least two weeks. Thus, since Snell also does not disclose or suggest these limitations of Claim 10, this claim can not be obvious due to Snell in combination with Nicolas. Accordingly, it is believed that the Examiner's 103(a) is overcome. Moreover, since now all the Examiner's objections and rejections have been overcome to Claim 10, it is believed that Claim 10 is in condition for allowance.

Rejection of Claims 11-14, 16-19, 21, 23-29, 31-34, 36, 38-46 under 35 USC 103(a) by Snell et. al. in view of Nicolas

Regarding Claims 11-14, 18, 19, 21, these claims were rejected under 103(a) by Snell in view of Nicolas. However, the Examiner has provided no additional reasoning for the rejection of these claims beyond the Examiner's comments directed to the 103(a) rejection of Claim 10. Accordingly, since the 103(a) rejection of Claim 10 is believed to be overcome, it is also believed that the 103(a) rejections by Snell in view of Nicolas of Claims 11-14, 18, 19, 21 is also overcome. Additionally, it is important to note that at least regarding the present 103(a) rejections, it is believed that the Claims 11-14, 18, 19, 21 provide additional limitations that are not disclosed or suggested in the combination of Snell and Nicolas. Moreover, the dependence of Claims 11-14, 18, 19, 21 upon Claim 10 also is believed to overcome the present 103(a) rejection.

Regarding Claim 17, the present 103(a) rejection of this claim is believed to be overcome due to its dependence upon Claim 10.

Regarding Claims 23 and 24, the Examiner states that the use of a material that is charred and/or burned would have been obvious to one having ordinary skill in the art at the time the invention was made, with the Examiner's reasoning being:

> "since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice, and because termites' place in the animal kingdom is to decompose material which is rotting or destroyed so that its nutrients may eventually be returned to the earth and the termites are particularly attracted to items which are in a state of decay. In re Leshin, 125 USPQ 416."

However, it is believed that there are important distinctions between the Examiner's reasoning here and the limitations of Claims 23 and 24.. In particular, it appears that Leshin is not applicable to the present case in that in Leshin, the "selection was of a known plastic to make a container of a type made of plastics prior to the invention" (see MPEP 2144.07). Thus, to use this same reasoning on, e.g., Claim 23, it appears that one must assume that there is known prior art wherein some other CO_2 emitting source material (***similar*** to a charred or burned material) is disclosed for satisfying ***all*** the limitations of Claim 10. It is respectfully submitted that no such prior art of record is known. Accordingly, it is believed that the Examiner's 103(a) rejection of Claim 23 is overcome. Moreover, the rejection of Claim 23 is also overcome due to the dependence of this claim upon Claim 10.

Regarding Claims 24, it is believed that similar reasoning as provided above for overcoming the 103(a) rejection of Claim 23 can be provided for overcoming the Examiner's rejection of Claim 24.

Regarding Claim 25, since the Examiner has provided no additional reasoning for the rejection of this claim beyond the Examiner's 103(a) comments recited above in rejecting Claim 10, the 103(a) rejection of Claim 25 is also believed to be overcome by the reasoning provided above for overcoming the Examiner's 103(a) rejection of Claim 10.

Regarding Claims 26-29, 31, 33, 34, 36, 37, 40, 42-44, these claims were rejected under 103(a) by Snell in view of Nicolas. However, the Examiner has provided no additional reasoning for the rejection of these claims beyond the Examiner's comments recited above in rejecting Claim 10. Accordingly, since the 103(a) rejection of Claim 10 is believed to be overcome, it is also believed that the 103(a) rejections by Snell in view of Nicolas of Claims

26-29, 31, 33, 34, 36, 37, 40, 42-44 is also overcome. Additionally, it is important to note that at least regarding the present 103(a) rejections, it is believed that the Claims 26-29, 31, 33, 34, 36, 37, 40, 42-44 provide additional limitations that are not disclosed or suggested in the combination of Snell and Nicolas. Moreover, the dependence of Claims 11-14, 18, 19, 21 upon Claim 25 also is believed to overcome the present 103(a) rejection.

Regarding Claim 32, the present 103(a) rejection of this claim is believed to be overcome due to its dependence upon Claim 25.

Regarding Claims 38 and 39, it is believed that similar reasoning as provided in the above paragraph for overcoming the 103(a) rejection of Claim 23 can be provided for overcoming the Examiner's 103(a) rejection of Claims 38 and 39, wherein the references to Claim 10 in this above paragraph are replaced by references to Claim 25.

Regarding Claim 41, the Examiner's 103(a) rejection is believed to be overcome due to the dependence of this claim upon Claim 25.

Regarding Claim 45, it is believed that the Examiner's 103(a) rejection as anticipated by Snell in view of Nicolas of this claim is overcome for substantially the same reasoning as for overcoming the Examiner's 103(a) rejection of Claim 25.

Regarding Claim 46, it is believed that the Examiner's 102(e) rejection as anticipated by Snell is overcome for substantially the same reasoning as for overcoming the Examiner's 103(a) rejection of Claim 10.

Rejections of Claims 15, 22, 30, and 37 under 35 USC 103(a) by Snell in view of Waters

The Examiner has rejected Claims 15, 22, 30 and 37 as being unpatentable over Snell in view of Waters, Jr. (US patent 4,506,473). The Examiner states that:

> "Snell et al. discloses the device with cavities (368 of Snell et al.) which may hold attractants such as water to stimulate termite activity, but do not disclose the emitting source which comprises a form of carbonate. Waters, Jr. discloses CO_2 generated by reacting a carbonate salt with an aqueous acid solution. It would have been obvious to a person of ordinary skill in the art to substitute the expanded polystyrene of Snell et al. for the carbonate of Waters, Jr. which generates CO_2 over time."

Regarding Claim 15, the present rejection is believed to be overcome by the dependence of this claim upon Claim 10.

Regarding Claim 22, this claim has been amended so that it no longer recites a form of carbonate. Thus, it is believed the present rejection of Claim 22 is now overcome. However, it is believed that the unamended version that recites a form of carbonate is also patentable. Accordingly this limitation remains as a patentable distinction in other claims herein, e.g., Claims 15, and 30.

Regarding Claim 15, the present rejection is believed to be overcome by the dependence of this claim upon Claim 25.

Regarding Claim 37, this claim has been amended so that it no longer recites a form of carbonate. Thus, it is believed the present rejection of Claim 37 is now overcome.

Rejections of Claims 20, and 35 under 35 USC 103(a) by Snell in view of Sherman

The Examiner has rejected Claims 20 and 35 as being unpatentable over Snell in view of Sherman (US patent 4,608,774). The Examiner states that:

> "Snell et al. discloses the device with cavities (368 of Snell et al.) which may hold attractants such as water to stimulate termite activity, but do not disclose the emitting source which comprises a microorganism generating the concentration. Sherman discloses the emitting source which comprises a microorganism (yeast) generating the concentration. It would have been obvious to a person of ordinary skill in the art to substitute the expanded polystyrene of Snell et al. for the microorganism of Sherman which generates CO_2 very cheaply and is easily replenish-able when desired whereas the expanded polystyrene may eventually evaporate all of its CO_2 over time."

The expanded polystyrene (364) is apparently one embodiment of the foam material 364 (also referred to as the "termite control material) that defines the cavities 368. Thus, if the fermentation liquid of Sherman were to replace the expanded polystyrene, then this liquid would drain out the bottom of the termite tube 182, and thus it appears unlikely that an extended concentration of CO_2 could be emitted according to the CO_2 concentration and duration ranges recited in Claim 10.

If, however, the Examiner is suggesting that the fermentation liquid of Sherman can be provided within the Snell cavities 368, then the following difficulties remain:

(A) Sherman's trap is for roaches only; there is no mention of termites or any other insect. Thus, it is believed that one of ordinary skill in the art would not look to a roach trap for determining how to generate a particular CO_2 concentration that is attractive to termites for "at least two weeks" as recited in Claim 10. Indeed, even those apparently well skilled in the art, such as Nelson and Sillans, state in the Nelson reference cited by the Examiner:

> "Perhaps the most striking impression left by the collective papers on CO_2 actions [on insects] is that of the **diversity of these actions and the wide variety of levels at which this gas may act**" (Nicolas, page 109, beginning of Concluding Remark); and

(B) Sherman does not disclose any particular CO_2 concentration or duration for attracting any insect.

Accordingly, it is believed that at least (3.3) of the obviousness criteria recited above is not provided by the combination of Snell and Sherman. That is, the cited references (Snell and Sherman) do not include an explicit teaching or requisite motivation for combining the claimed limitations. In fact, it is believed that there is no additional reference(s) that the Examiner could cite to teach, or even suggest, that termites and roaches are sufficiently biologically similar so that a CO_2 concentration for attracting roaches is known to attract termites. In particular, it is well known that roaches will eat and thrive on a substantially more varied diet than termites.

Thus, for the reasoning provided immediately above, as well as the fact that Claim 20 is dependent upon Claim 10, it is believed that the 103(a) rejection of Claim 20 is overcome.

Regarding Claim 35, the above reasoning for overcoming the 103(a) rejection of Claim 20 is also applicable to overcoming the 103(a) rejection of Claim 35. Additionally, it is believed that this rejection of Claim 35 is overcome due to this claim's dependence upon Claim 25.

New Claims

Regarding Claims 47 - 50, 52, 54, 57, and 60 – 64, these claims are believed patentable due to their dependence upon patentable Claim 10. However, it is important to note that Claims 60 through 62, and Claims 64 through 65 are particularly directed at further distinguishing the present invention from the Examiner's application of Schmittman in combination with features such as naturally occurring ground openings to a termite colony. Additionally, Claims 60 through 65 are particularly directed to further distinguishing the present invention from other "natural" or non-man made phenomena that might emit some amount of CO_2.

Regarding Claim 51, it is believed that the prior art does not appreciate and does not disclose attracting termites away from a structure that is desired to be protected from termite damage. Thus, providing the claimed enclosures at locations that are spaced apart from the structure by approximately one meter is believed to be particularly novel in view of the additional limitations of Claim 10. Accordingly, Claim 51 is patentable both for the reasoning supplied here, as well as due to the fact that Claim 51 is dependent upon Claim 10.

Regarding Claim 53, this claim is believed patentable since it is dependent upon patentable Claim 18.

Regarding Claims 55 and 77, these claims are believed patentable both due to the fact that no prior art discloses emitting a particular concentration of hexaflumuron for attracting termites, and due to these claims being dependent upon patentable Claims 19 and 34 respectively.

Regarding Claims 58 and 59, these claims are believed patentable both due to their dependence upon Claim 10, and additionally, due to the fact that no prior art discloses or suggests using sodium bicarbonate, or spent grain extract.

Regarding Claims 66, 67, 72, 73, 90, 91, 97 and 98 these claims recite, as at least part of the CO_2 emitting source, one of: a product derived from corn or corn cob grits. It is believed that there is no prior art which teaches or suggests using either of these products for attracting termites, e.g., in combination with the additional limitations of each claims' corresponding antecedent base claim (i.e., Claim 10, 25, 45, or 46). Accordingly, it is

believed these claims are patentable both due to the reasoning set forth here as well as their dependence their corresponding antecedent base claim.

Regarding Claims 68 through 70, and 85 through 87, these claims recite using a particular CO_2 concentration range for attracting one of the termite species: Reticulitermes tibialis, Reticulitermes flavipes, or Reticulitermes virginicus. It is believed that there is no prior art which teaches or suggests attracting termites these termite species, e.g., in combination with the additional limitations of each claims' corresponding antecedent base claim (i.e., Claim 10, or 25). Accordingly, it is believed these claims are patentable both due to the reasoning set forth here as well as their dependence their corresponding antecedent base claim.

Regarding Claim 77, it is believed that there is no prior art that recites providing hexaflumuron in an enclosure for attracting termites by emitting a particular CO_2 concentration. Accordingly, it is believed Claim 77 is patentable both due to the reasoning set forth here as well as this claim's dependence upon Claim 25 (via Claims 34 and 33).

Regarding Claim 71, this claim is believed patentable both due it being dependent upon patentable Claim 25, as well as due to the fact that no prior art teaches or suggests attracting termites with sodium bicarbonate as a CO_2 emitting source.

Regarding Claims 74, 75, 76, 79 and 84, these claims are believed patentable due to their dependence upon Claim 25.

Regarding Claims 80 through 83, and Claims 94, 95, these claims are believed patentable for similar reasoning as provided for Claims 62 through 65 above.

Regarding Claim 88 and 89, these claims are believed patentable due to their dependence upon Claim 45.

Regarding Claims 92, 93, and 96, these claims are believed patentable due to their dependence upon Claim 46.

Regarding Claims 56 and 78, the Examiner rejected their respective antecedent Claims 20 and 35 under 35 USC 103(a) by Snell in view of Sherman. In particular, the Examiner apparently believes that the yeast fermentation mentioned in Sherman for generating CO_2 would be effective for use in some embodiment of Snell. Claims 56 and 78 recite that the "desired position" where the CO_2 emitting enclosure is placed, is outdoors. Note that temperature ranges of: less than 60°**F**, or greater than approximately 104°**F** are

frequently recorded in the outdoors of Northern Colorado where many of the termite experiments occurred that are disclosed in the in the present application. Moreover, temperature ranges of: less than 60°F (certainly less than 50°F), or greater than approximately 104°F are generally considered outdoor temperature ranges. It is respectfully submitted that attempting to generate CO_2 via a yeast fermentation process will not work when these outdoor temperature ranges are encountered. Yeast are very sensitive to temperature, and their production of CO_2 is also temperature sensitive. For example, yeasts die at approximately 104°F and it is believed that their production of CO_2 decreases and/or ceases in the range of 50°F to 60°F as indicated by the references in APPENDIX A hereinbelow.

Sherman's roach trap is apparently for use indoors, and Sherman states as much in that he states: "Miniature or reduced size roach traps are attractive to the consumer, due to the fact that they can be placed in those out of the way inaccessable areas that roaches seem to prefer such as behind refrigeration, under sinks, next to pipe entries, etc." (Sherman, Col. 1, lines 23-27). Accordingly, Sherman in combination with Snell will not necessarily generate an appropriate concentration of CO_2 in most outdoor environments. Thus, it is believed that Claims 56 and 78 are patentable both due to the reasoning provided here as well due to their dependence upon respective Claims 10 and 25.

Conclusion

Since all of the Examiner's objections and rejections have been addressed and overcome, it is requested that the Examiner reconsider the claims of the present application and promptly allow the present application to proceed to issuance. Should the Examiner have further concerns regarding the patentability of the application, it is respectfully requested that the Examiner contact the undersigned Applicant's representative.

Applicants have previously paid for 37 total claims, including 7 independent claims. Upon entry of the this Amendment, there will be 86 total claims, including 4 independent claims. A check for $882.00 is enclosed to pay for the additional 49 claims provided with this response. Applicants believe there are no other fees due in connection with the filing of this Amendment. However, if any additional fees are due, please charge Deposit Account No. 19-1970.

Respectfully submitted,

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By: _____

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Date: Nov. 20, 2003

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APPENDIX A

From: http://spot.colorado.edu/~basey/rengel.html

Respiration Rates by Yeast with Different Sugar Substrates and Temperatures

Aime Rengel, Travis Vickers

CU Boulder, Fall 2002

In this lab we tested the effects of different types of sugar and temperature on the release of CO_2 in yeast. Through research, we learned that yeast uses the carbon in the sugar as a source of energy and produces CO_2 through respiration. We hypothesized that adding different sugars would affect the rate of CO_2 released, and that colder temperatures will decrease the amount of CO_2 released by slowing down the yeast's metabolism.

To test this hypothesis, we mixed 0.63 grams of yeast with 10ml of warm water in a beaker. We then attached a gas probe to measure CO_2 and measured the rate of respiration for five minutes; this was our control group. Next we made three more batches like the control group, but added 0.90 grams of a different sugar in each beaker: Equal, cane sugar, and table sugar. We then measured the amount of CO_2 released by the different sugar and yeast solutions. Since table sugar is meant for baking, we predicted this would give us the best results when mixed with yeast (highest CO_2 release). Conversely, since Equal is basically a fake sugar, we predicted it would have the worst results when mixed with yeast (lowest CO_2 release). We also predicted that when the beakers are submerged in an ice bath, the reactions will slow down, causing less CO_2 to be released than at room temperature.

According to the t-test the difference between our control group and our mixtures of yeast with Equal (P=0.0008), yeast with cane sugar (P=0.005), and yeast with table sugar (P=0.0002) at room temperature were all significantly different from the control

($P<0.05$). Also, the difference between our control group and our mixtures of yeast with Equal ($P=0.027$), yeast with cane sugar ($P=0.018$), and yeast with table sugar ($P=0.018$) when placed in an ice bath were significantly different.

Our results are consistent with our predictions. One potential problem with our experimental design was the water temperature while mixing the yeast. We needed hot water, and while we used hot water from the tap, chances are the same temperature wasn't used every time; and as the ice bath experiment shows, temperature does make a difference. Next time, using a thermometer could help keep all the water used at the same temperature, helping make things more accurate. We were not able to look at different analyses off the CABLE website because we couldn't find anyone else who had performed this kind of experiment. Since our results show significant differences, we stick to our original hypothesis, both for sugar and temperature. We think that if we ran our tests for ten minutes, instead of five, we would get even more conclusive results. We think that similar experiments performed in the future that compare only natural sugars, like sucrose and fructose, would have a much smaller difference in results.

From: http://www.thekrib.com/Plants/CO2/co2-ferm.html

Yeast CO2 Stopped

by Jim Spencer <jimsp/yahoo.com>
Date: Thu, 19 Feb 1998

Darrell wrote;

>>It seems that the never-ending question regarding yeast CO2 is why it is not lasting very long. CO2 should last at least 3 to 4 weeks. If it is not, you can check the following:

>

>snip

The things you list are good things to check but I think you left out one of the most likely causes of CO2 quitting. Allowing the

temperature to drop below about 70F seems to be a good way to kill the yeast reaction. The problem is many of us have homes where room temperatures drop into the 60's - especially at night. The problems with trying to keep the reactor warm without heating up the whole house is one of the reasons I switched to a compressed gas cylinder for my CO2 supply.

Unfortunately when people post success formulas with yeast generated CO2 they rarely mention the temperature they keep their reactor at and people miss the importance of keeping the reactor warm.